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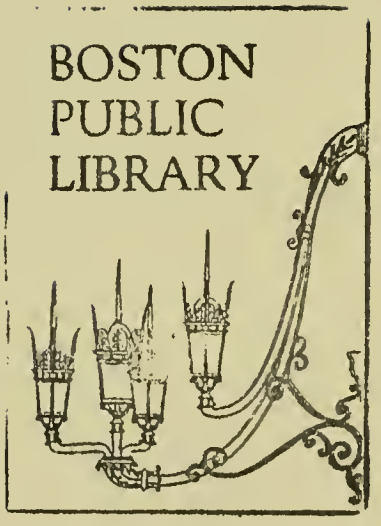
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REVISED *

ANN WOLPERT

PRELIMINARY REPORT ON ASPECTS OF THE SAWMILL BROOK STUDY AREA

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Appendix A Soils Report

Appendix B Sample Flood Plain Zoning Text

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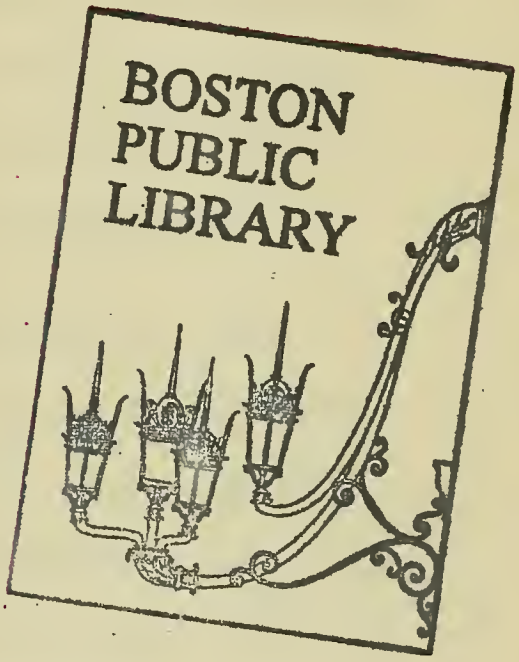

* Revised after review and comment by Doyle, Basile, Childs and Hill of Corps of Engineers. Their review and comment was concerned with technical accuracy and does not constitute an endorsement of our proposals.

Prepared by:

Nick Greer
Rich Untermann
March 16, 1970

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BRA

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FLOW

The Charles generally flows very slowly along its entire length. The exception is during the spring run-off when the flood crest sometimes moves more rapidly, but still very slowly compared with other streams. At times, during the summer, up to 15 million gallons of MDC water a day (at a cost of $150 a day) are added to the Charles near Quinobequin Road in Wellesley when the Department of Public Health determines that lowness will create a nuisance. This is downstream of the site and thus has no effect upon the Sawmill portion of the Charles.

The MDC has plans prepared by Civil Engineer Howard Turner to enlarge Long Ditch (just west of the site, in Cutler Park) which cuts across the neck of "Dedham Island" (the "island" is actually more like a penninsula) and to install flood gates. The purpose of this to divert a portion of the flood crest through the ditch to flow into the Charles just downstream of Cow Island Pond ahead of that portion of the crest which is not so diverted. This would however have no effect on the Sawmill site, but would very slightly lower flood stages in the Dedham area. It also presents two attractive off-site development opportunities:

1. The widening could be done in such a way that the ditch would be usable for canoeing.
2. Material removed from the ditch in the widening would be available for filling the bed of the MDC road from

VFW Parkway in the vicinity of Baker Street to Route 135. (There would however be a need for other fill, in addition to that from the widening.)

The Corps feels that there are no potential flood control projects in the area in which they would be interested.

This portion of the river is not considered "navigable" by the Corps of Engineers (source: Frank Forgerty, Chief of Operations Division. The Corps thus can not do dredging. They do however, have a hydrologist who is available for consultation on such matters as the design configuration of the new pond and the effects of widening and deepening the river.

The normal height of this portion of the river is 92.65 (Boston base). Annual flood and spring run-off is approximately 3 feet - to elevation of 100 feet as the lowest foundation level for buildings on the site.

The Corps believes that a pond on the Charles, regardless of size, would have no appreciable effect upon flooding, as it would be full in normal times and thus have no capacity for storing flood waters. The river is too flat in this area to allow for lowering the pond prior to storms.

Channel improvements between the Silk Mill Dam and Kendrick Street, and modifications to the Dam, following the 1955 flood, will reduce future flood stages. The March 1968 flood, similar in discharge to the 1955 event only rose to elevation 95.1 feet at Cow Island Pond.

The flood plain portion of the "site" should be preserved. If this plan is implemented, BRA will be establishing a precedent for the eventual loss of the entire flood plain in this area.

The Corps stressed that flooding of the site will not be materially lessened because of new dams up-stream, as new development occurs so rapidly that these dams just about preserve the status quo.

Permits from the State DPW Division of Waterways would be required for any dredging or filling of the Charles. The division has a hydraulic engineer (John Plaseczny) that will work with us on the design of the new pond and any other dredging or filling we propose. A license would have to be obtained for any new bridge that might be constructed. This license would set the horizontal and vertical clear spans that would have to be provided. The DPW's Bridge Department will work with us on this, if requested. Bob McDonough is our contact in that department. These are the division's only concerns. They would not be involved in any other aspects of our proposal.

POLLUTION

The Charles is a class "B" river in this vicinity. This classification is set by the Department of Public Health and

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POLLUTION

The Charles is a class "B" river in this vicinity. This classification is set by the Department of Public Health and

pollution. However, the river and the new and existing ponds will have great fishing, boating, aesthetic value. Coloration and turbidity are measured by the "secchi disk" method in accordance with legislation passed in 1969. We will obtain a copy of this legislation.

There is some seepage or leeching of pollutants from the Gardner Street Dump into the Charles. It is believed that most of this enters the river via both the Old Sawmill Brook and the re-located brook which skirts the dump. (That which enters via the old brook does so underground). This leeching will continue for a number of years, however it should be possible to divert this flow so that it all enters the Charles downstream of active recreation areas.

A man-introduced source of pollution of which the average citizen is not aware is storm water run-off. In a stream flowing as slowly as the Charles this can be a major pollution source, especially during the first few hours of a storm. Storm drainage of the site should therefore also be designed as much as possible to enter the Charles down-stream of active recreation areas.

In addition to man-added pollution, there are also natural sources of pollution. Duck-weed (a floating plant) when

it decomposes has a very foul smell. Often portions of the river will smell as though they are badly polluted when in fact they are not. Another minor source of natural pollution is bird and animal wastes. In fact, some cities have had to roof over their drinking water reservoirs or increase chlorination because of sea-gull pollution.

SEWERS AND WATER

Development plans for the site should not be limited by MDC's ability to sewer the area, as they are required to provide sewers for any development in their district. In fact, since construction of the "Wellesley Relief Sewer" (serving Framingham, Natick, Dover, Needham, Wellesley, and Dedham) the MDC has an excess capacity in the site area of 13 million gallons a day.

The existing trunk sewer running through the project has an available capacity of about 3 mg/d which will satisfy the need for 10,000 people (300 gallons per capita per day). The Wellesley Relief Sewer has an available capacity of about 13 mg/d which will handle a population of about 43,000. The relief sewer is located approximately a mile from the project site and the cost to connect would be approximately three quarters of a million dollars.

Information regarding the existing water system in the project area is very sketchy. It is recommended that tests be performed on both the 20" and 24" lines in Center Street. (This line reduces from a 24" to a 20".) It is conceivable that the existing 20" line could feed a project of approximately 15,000 people by constructing a loop through the project at a cost of approximately $100. per foot. The existing 20" would be connected into at the intersection of Spring and Center Streets. A tap could be made from the 24" before it reduces, on Center Street at Manthorne Road which is an additional 5,000 feet from the intersection of Spring and Center Streets. The nearest connection to the MDC transmission line is about four miles away.

A map has been prepared, based upon discussions with the Corps of Engineers, the M.D.C., and our own topographic studies, which indicates the frequency with which the lands in the Sawmill area are flooded. The map shows four categories:

1. The area which is subject to annual flooding.
2. The area which is subject to infrequent flooding.
3. The area which never floods.
4. The area which we feel has due to past encroachments, become an inactive flood plain; that is, while it may be subject to inundation, it has been isolated from

the river and waters entering the area become entrapped and stagnate.

It is our proposal to fill area 4 with porous material so that it will no longer have surface ponds subject to stagnation.

In addition, we propose to fill portions of Area 1 with 2 to 3 feet of porous material in order that grass can be grown and portions of this area used for active and passive recreation. The Corps has expressed its opinion that this fill could be placed in such a way as to have no effect on downstream flooding.

We also propose that portions of the site yet to be determined will remain as they now are, or will be improved if improvement is determined to be necessary, so that they can adequately serve conservation purposes.

In accordance with the MAPC recommendation, we further propose the creation of a new pond of approximately 60-100 acres in the Charles River in the vicinity of the present junction of the Sawmill Brook and the Charles for active and passive recreation use.

The Corps is very concerned about fill in Area 2. They state that fill in this "25 year" flood plain could be dangerous

in terms of its effect on downstream flooding. We should therefore propose little or no fill in this area.

V FLOODING

Flooding is closely related to flow which was discussed in Section I. This section should therefore not be read without first reading Section I.

Portions of the site are Flood Plains which fill several important ecological and flood prevention roles including:

1) FLOOD WATER STORAGE AREAS. Large flat areas of land at about the same elevation as the river that during heavy rains catch excess runoff store it until the rain stops and the river can drain properly. The capacity of a flood plain depends on its size, and its elevation relative to the river and the depth of water which can be stored during flooding. Therefore, if the flood plain is 100 acres, and it can flood to three feet deep, it has a storage capacity of 300 acre feet of water. (This isn't exactly true, for the soil acts as a sponge and absorbs additional water).

2) LOW FLOW AUGMENTATION. The peat subsoil generally found in a marsh acts as a sponge and absorbs water. This water is stored, and slowly released during the summer months when the Charles River is low and running

In the area served by the M.D.C. the only consideration the Department of Natural Resources acts on is flood control. They do not consider low flow augmentation or the protection of ground water levels as being covered by the phrase "public or private water supply."

The plans are submitted to the Mayor who holds a public hearing and forwards recommendations to the Department of Natural Resources. In past Boston cases, Mayor Collins delegated the responsibility for holding the hearing to the Public Improvements Commission in the Public Works Department. If the proposed development is being done by a city agency, this hearing is waived by a recent amendment to the Act.

The plans are also submitted to the Massachusetts Department of Public Works, and reviewed for possible conflict with the provisions of Chapter 91, which covers waterways. So long as the proper procedures are followed, the Hatch Act should offer no obstacles for the Sawmill Project.

The Inlands Wetlands Act enables the Commissioner of Natural Resources to impose restrictions on the use and development of specific inland wetlands, for a much broader group of

considerations than just water supply and flood control. So far, the Department has not designated any wetlands for protection under this Act. Therefore, this legislation could not effect any land in Boston until the D.N.R. took the initiative, which would require notice to owners and a public hearing. (The department can however take the initiative after an application has been submitted to it for action.)

Whether or not the Inland Wetland Act applies to the site will depend upon a ruling from DNR, as George R. Sprague, Director of the Division of Conservation Resources has written:

> "The law which emerged from the Legislature can only protect area which are wet all year around. Thus, for example, river banks which may be under water in a spring flood, but relatively dry in summer and fall, cannot be protected by the Inland Wetlands Act."

This interpretation puts most of Sawmill beyond the reach of the act. However, the act itself states:

> "In this section the term "inland wetlands" shall mean any marsh or swamp bordering on inland waters or that portion of any bank which touches any inland

waters, or any marsh or swamp subject to flooding by fresh water."

A letter to Commissioner Brownell from Director Warner has been drafted to obtain a clarification of this matter.

Flood Plain Zoning The most effective way, short of acquisition, for a municipality to ensure preservation of flood plains is through zoning. Neither of the above acts is a substitute for such zoning, as both operate somewhat "after the fact." Boston now has no such zones. Sawmill might provide the impetus for their creation. A copy of the relevant portions of the Concord, New Hampshire Zoning Ordinance is attached. It should be noted that in Massachusetts even zoning is not too effective, because it is subject to change by the Board of Appeal.

OPEN SPACE

The MAPC in Volume 4 of its open space and recreation program for Metropolitan Boston states that: "The term 'open space' does not describe a particular type or use of land. It is simply a predominantly vacant land or water area of sufficient size, utility or beauty that its presence is a public benefit. Further definition is fruitless until one identifies the problem to be solved or the value to be preserved. Open space is both a wilderness and a backyard;

it can be either publicly or privately owned, rural or urban."

This definition is a good one, and it is important that it be kept in mind when discussing the site. A considerable portion of the site should be open space. An exact breakdown of just how many acres should be devoted to the various types of open space will have to await final plan preparation.

VI CONSERVATION

Conservation is defined by Webster as official maintenance and supervision of natural resources to conserve, preserve, guard, protect or keep them in a safe or entire state.

Due to encroachment of urban development, including intensive activity at the dump, it is doubtful that any major part of the site is amenable to conservation. It is not used by wildlfie other than sea-gulls and rats at this time.

The M.D.C.'s extensive and isolated Cutler Park abuts the site on two sides. Cutler Park contains 835 acres bounded on one side by Route 128 and on another by the Charles, most of the land in the park is thus sufficient distance from homes and other urban development to be ideal for wildlife. It contains a rich variety of habitat; marshes, small hills, groves, fields, and meadows.

M.D.C. has plans, prepared in 1956 by Edwards and Kelcey for the development of Cutler Park. They have a proposal dated February 1970 by Robert Homer & Associates for a new plan for this development. It is the M.D.C.'s intent to develop the area as a "semi-wild" area, but including picnicing, and other active uses. Whether or not they procede with planning and implementation of the plans depends upon recently appointed M.D.C. Commissioner Sears (Whitmore wanted to).

M.D.C. plans to construct an access and parking road into the park from New England Industrial Park in Needham, next to Georgia Pacific's building. This road will end in an existing pine grove, but might extend to Needham Street in the future.

Statute 581 of 1956 authorizes M.D.C. to construct a parkway from V.F.W. Highway in the vicinity of Baker Street to the Great Plain Avenue interchange with 128. No funds were appropriated, but some of the people in the area supported the legislation. In 1960 the State D.P.W. prepared two location studies for this parkway, each study considered three alternates. One alternative was an almost straight-line connection of the two points, one was a "T" intersection with 128 via a new

interchange, and the third was an "S" shaped road providing maximum access to Cutler Park. The State refers to this as their "Needham Marshes" Highway Study. At that time there was some urgency to the study as a new industrial area including a major Sylvania Plant was being proposed. No action was taken on these plans.

As will be discussed in Section VI, there is considerable demand for recreation facilities and play fields in the area. Provision of these on the site, as part of a co-ordinated plan with the M.D.C. would relieve the pressure to develop Cutler Park for active recreation uses.

The Mayor's recent proposal to the City Council that the city create a conservation commission should be to the advantage of development of the site. If the commission is created and works on the development plan, the plan may be much more acceptable to similar commissions in the surrounding towns. Needham, Dedham, and Newton have formed a board with representatives from both the conservation and recreation commissions of each town specifically concerned with the future of Cutler Park.

VII RECREATION

The MAPC in Volume 3 of its recreation program for Metropolitan

Boston states that "Because it will be so readily accessible, and because so much land has been filled, intensive recreational facilities are recommended, with the transit terminal developed in a complementary fashion.

"This site, as in Medford on the Mystic River, is ideal for the development of a metropolitan athletic center to meet the need for a wide range of individual and group sports which are beyond the means of individual school systems. Dredging, widening and ponding of the River is proposed to serve two purposes: flood control and boating. The water quality in this area is expected to be improved to the point where swimming and boating will be possible. The newly enlarged water area would provide space for sailing, canoeing and crew for both individuals and organizations. Although Havey Beach may be rehabilitated for swimming, an indoor Olympic-size pool is also recommended for all-season use. A tennis center, play field and expanded ice-skating rink facility would make Cow Island an all-weather, all-season recreation area for use by individuals, schools, and other groups."

MAPC also recommended Metropolitan District Commission acquisition of the dump and related lands, and stated that

"The Commission should also prepare a detailed site plan and development program for the area. The Cow Island Pond project is of high priority."

Other recommendations for the site or nearby Cutler Park include A.D.L.'s selection of Cutler Park as an alternate site for Expo Boston '76, and a proposal to use 150 acres for a Metropolitan Boston Stadium. Both of these proposals have been abandoned.

As discussed in Section V, development of the open space on the site for active recreation would relieve pressure for such development in Cutler Park. The exact facilities and fields to be developed on the site will have to be determined as the plan progresses, but should provide for the needs of West Roxbury as well as site occupants and the metropolitan area.

II FILL

As discussed in Section II, fill of the lowest areas with 2-3 feet of porous material could be done in such a way as to not adversely effect flooding, but fill of higher areas could be dangerous.

Hydraulic dredge and fill is possible in this area, and if enough good gravelly soil is available is the cheapest way to fill land.

For quantities required, an 18" dredge would be used, with placed fill (including all costs) running between .75 and $1.00 per yard. This cost is less than half the amount we used in our initial cost estimate.

The complete process would last at least a year - running 24 hours per day (3000-7500 cu.yd./day). The dredge has a 30' depth limitation, and can move fill for a distance up to 5000'. Start up costs run $200,000 - so it is best to do the entire operation in one movement. 1 million cubic yards is the lowest amount at which hydraulic dredge is advantageous in this area. (We will probably require between one and two million cubic yards.)

Peat removal would cost about .50 cu.yd. to dredge and stockpile. Removal from the site would be extra. Stockpiling and drying would take approximately 6 months before it could be removed from the site and might create a smell problem.

Rail import of gravelly soil has become quite costly, as the closest sources for the quantities required are in New Hampshire. This soil would cost approximately $2.50 per cubic yard, delivered to the site.

IX SOILS REPORT

The initial report submitted to the BRA by the Soil Engineers, Goldberg-Zoino is attached. They have had a good deal of success in compiling information concerning Sawmill, and their general feeling is that the area contains a substantial deposit of fine sand and silt, which means that our proposals for dredging are feasible. At the same time, however, they note that the Gardner Street Dump might be as much as twice as deep as we had originally estimated, and that although no substantial deposits of peat are presently comtemplated, there are areas covered by approximately 10 feet of peat.

However, none of these conclusions are detrimental to the development of Sawmill, and at least thus far, none of our early thinking on the development should be altered.

The consultants go on to recommend an on-site exploratory program which would be required to substantiate their findings and provide us with more definitive information.

Since at this time we do not have sufficient funds for such a program (approximately $15,000 - $20,000) and since we do not actually need this additional information until our work progresses further, Dave Weiner has recommended that the

consultants cease further work on Sawmill until they are given new directives by him. The only additional work that they will do will be to finalize their estimate of cost for the exploratory program and to submit plans showing the location of borings, load tests, etc.

X PRINCIPAL PERSONS AND AGENCIES CONTACTED

A. Flow

Corps of Engineers : John Lind, Arthur Doyle
Frank Fogarty
(894-2400 x 320)
Mass. D.P.W. - Division of Waterways, Mr. Hannon,
John Plaseczny, Hydraulic Engineer

B. Pollution

Mass. Department of Public Health, Richard Power
(727-2655)
Mario Buchetti (727-2655)
Mass. D.N.R. Water Pollution Division, Alfred F. Ferullo
(722-2855)

C. Sewers and Water

MDC, Bill Green, Chief Sanitary Engineer
MDC, A.C. Hayes, Sewer Engineer

D. Flood

U.S. Geologic Survey, Mr. Wood
New England River Basin Commission, Malcom Graf

E. Open Space

MDC, Ben Fink, Max Straw

F. Conservation

Mass. DNR, Arthur Brownell, Commissioner
George R. Sprague, Director of Conservation
Services Department
Mass. Audubon Society, Dr. James D. Lazell, Jim Biard
Natural History Services, Bud Jenkins

G. Recreation

H. Fill

Perini Corporation, Charles Richardson
Goldberg - Zoino and Associates, Richard Murdoch
(868-1850)

APPENDIX A

SOILS REPORT

GOLDBERG — ZOINO & ASSOCIATES, INC. • *Soil and Foundation Engineers*

905 Main Street
Cambridge, Mass. 02139

Telephone 868-1850
Area Code 617

Donald T. Goldberg
William S. Zoino

consultant
Steve J. Poulos

R. Underwood
Auto. Engr.

February 24, 1970
File No. 582

Mr. David Weiner
Boston Redevelopment Authority
City Hall, Room 900
One City Hall Square
Boston, Massachusetts 02201

Dear Mr. Weiner:

The attached report is a brief summary of the results of our initial literature review of the available historical and topographical information pertaining to the Sawmill project. The site appears to be generally underlain by a substantial deposit of fine sand and silt. One area is overlain by 30 to 60 feet of solid wastes comprising the Gardner Street landfill. The remaining areas appear to be either low lying marshes containing a shallow depth of compressible organic soils or knolls and knobes containing outwash sand and gravels.

Based on these preliminary initial findings, we propose an on-site exploratory program as outlined in our report.

Very truly yours,

Richard F. Murdock

Richard F. Murdock

RFM:vpm
Enc.

SAWMILL PROJECT

Job No. 582
February 24, 1970

Summary of Existing Historical and Topographical Information Associated With the Sawmill Project, West Newbury, Massachusetts

The historical and topographical information which was obtained during this initial literature review is summarized below with each section preceded by the source of the information.

A. Rare Books Department
Boston Public Library
City of Boston

1. A plan of the general area prepared by T. B. Moses in 1873 drawn to a scale of 1 inch = 700 feet.

2. Plan shows the existence of several prominent knolls and lobes in the vicinity of the Gardner Street landfill. These features are surrounded by a swamp with an established drainage pattern similar to the former Sawmill Brook scheme.

3. These knolls and lobes are probably the remnant of outwash plains and terraces resulting from the retreat of the glacier during the last period of glaciation.

4. A road over the swamp connects the largest knoll with the mainland (in the vicinity of the present Gardner Street).

B. Dr. C. Kaye, Engineering Geologist
Engineering Geology Branch
U.S. Geological Survey
Broad Street
Boston, Massachusetts

1. A topographical map for the Boston quadrangle issued by the USGS in 1903 with a scale of 1 inch = 1 mile shows the existences of Cow Island on which several streets have been located. Cow Island has the same approximate configuration at the largest knoll shown on the plan by T. B. Moses.

2. An examination of the available aerial photographs implies the existence of extensive outwash plains and terraces over the entire site. Small kettle-like depressions in some of these deposits are probably the result of former excavations for sand and gravel.

C. Mr. Paul Chaney, Director
Water Department
Town of Brookline

1. The Brookline Water Department acquired several hundred acres of land on both sides of the Charles River in the 1870's in the vicinity of the present Sawmill Project.

2. Around the beginning of the 1900's, an extensive well field of 2-1/2 inch driven well was established on the Needham side of the Charles River. These wells were driven to a depth from 40 to 90 feet in deposits of pervious materials such as sands and gravels. Unfortunately no well logs were found during this investigation. The wells were connected to a 24 inch suction header line which passed underneath the Charles River and terminated at a pumping station located at the site of the present Rexall Building on Rivermoor Street.

3. In the 1920's several large Lane-Bower gravel packed wells were constructed with 60 inch diameter casing with a final 24 inch diameter developed well employing an 18 inch screen. Similarly these wells extended to a maximum depth of 90 feet. Logs of these wells are supposedly in existence, but have not been located to date.

4. The Brookline Water Department pumping operation was discontinued in 1954 with some of the property being sold to the City of Boston for inclusion in the Gardner Street landfill.

D. Mr. J.F. Flaherty, Division Engineer
Public Works Department
City of Boston

1. The City of Boston acquired the landfill site in 1954. At the time the city purchased the landfill area, a portion was being operated as a refuse fill by the J.J. Moore Co. Moore placed refuse on the site between 1948 and 1954 when the City acquired the property.

2. Aerial photographs taken in 1951 showed large water filled holes resulting from the excavation for sand and gravel. These pends were later filled with refuse.

3. Presently the maximum depth of the refuse at the landfill is 65 feet.

4. Along the northern perimeter of the landfill, the refuse has been dumped over 10 feet of fibrous peat. The peat is underlain by fine silty sand.

5. The original Sawmill Brook stream course has been relocated and presently flows along the northern perimeter of the landfill.

E. Mr. M. H. Straw
Administrative Assistant to the Commissioner
Metropolitan District Commission
Somerset Street
Boston, Massachusetts

1. A photo analysis and survey of the Charles area in the vicinity of the Sawmill Project was performed in 1957 by Donald J. Belcher and Associates.

2. A plan accompanying this report postulates the existence of several large kettle-shaped depressions filled with compressible soils such as organic silt and peat up to 36 feet in depth.

3. With the exception of these kettle holes, the remainder of the low lying area adjacent to the landfill is indicated as 1 to 10 feet of compressible material underlain by granular material.

F. Additional Sources

1. Borings data was obtained along the New York Central Budd-line which runs along the southern perimeter of the Gardner Street landfill, then crossed the Charles River into Needham through Cutler Park.

2. The borings along this Budd-line near the existing drive-in theater indicate a 5 to 7 feet deposit of peat underlain by up to 70 feet of silty fine sand with an occasional thin layer of clay and trace of gravel.

3. Along the Budd-line passing through Cutler Park, the borings indicate occasional deposits of peat up to 3 and 4 feet thick underlain by a substantial deposit of sand, gravel with some silt.

The objectives of proposed site investigation for the Sawmill project are as follows:

1. Determine whether 1.2 million cubic yards of granular soil are available using a hydraulic dredge scheme in the Charles River.

2. Obtain a range for the depth and lateral extent of the compressible organic soils which exist in the low lying areas adjacent to the Gardner Street landfill.

3. Determine a range for the depth and character of refuse comprising the Gardner Street landfill.

4. Establish the compressibility characteristics of the refuse.

5. Monitor the character of the noxious gases produced by the organic decomposition of refuse in the landfill.

6. Establish criteria for alternate foundation schemes of proposed buildings to be constructed over the landfill and adjacent property.

To accomplish these objectives, an initial site exploration program is proposed as follows:

1. A series of 2-1/2 diameter casing borings with split spoon samples which will assist in:

    a. locating suitable quantities of granular material for a possible hydraulic dredge operation;

    b. provide information on the variable depth of the Gardner Street landfill.

2. Peat probes taken to delineate the compressible organic soils in the low lying areas adjacent to the landfill.

3. A field surcharge test fill to be constructed on the landfill to establish a range for the compressibility characteristics of the fill.

4. Install preforated well probes in the landfill to collect samples of the noxious gases produced as a by-product of organic decomposition of the refuse.

5. Test pits will be excavated using a backhoe in the landfill area to examine the character of the refuse near the surface and in other pre-selected sites where shallow explorations are deemed necessary.

APPENDIX B

SAMPLE FLOOD PLAIN ZONING TEXT

"Excerpts from Concord, New Hampshire Zoning Ordinance"

Article 10. FLOODPLAIN (F) DISTRICT

Floodplain District - Lands placed in a F district shall also be in another district. Dwellings shall not be permitted in the F district.

No building shall be erected in a F district unless the first floor elevation is higher than the flood elevation established by the City Engineer based upon studies made by the U.S. Corps of Engineers, or the building is suitably anchored and flood-proofed to that elevation.

Article 11. FLOODWAY (F2) DISTRICT

Floodway District - Lands placed in F2 district shall also be in another district. Buildings shall not be permitted in the F2 district.

No structure, fill, obstruction, or encroachment of any kind shall be placed in an F2 district if the City Engineer determines that such structure, fill, obstruction, or encroachment will adversely effect the flood carrying capacity of the floodway or flood heights along the floodplain, or create a hazard to life and property along the floodway. In making his determination, he may consult with the U.S. Corps of Engineers or such other experts as he deems necessary.